Benjamin Abrams

Literature Review

In an attempt to more effectively summarize the too much time I spent doing a literature review, I will briefly overview and categorize some of the most influential literature I read.

Carbon Cap and Trade/Pricing

This was my entry point to this topic. This is the necessary solution; as Richard Thaler puts it, "We believe that the first step for climate change has to be to get the prices, right. On that we agree with every economist."

Its history is closely tied to the history of classical economics and how we view natural resources. This is true in an Aristotelian or Lockean sense. It is also true in the context of Alfred Pigou and Ronald Coase in the 1920s and '60s, respectively, and their perspectives on a market's role in externalities.

They had a real chance to be passed in the '90s and early 2000s, but were effectively campaigned against by the fossil fuel industry. The Franta paper and Tietenberg talk are particularly accessible starting points for the economic history of cap-and-trade.

Franta, B. (2021). Weaponizing economics: Big Oil, economic consultants, and climate policy delay. *Environmental Politics*, *31*(4), 555–575. https://doi.org/10.1080/09644016.2021.1947636

Schmalensee, R., & Stavins, R. N. (2019). Policy Evolution under the Clean Air Act. *The Journal of Economic Perspectives*, *33*(4), 27–50. https://doi.org/10.1257/jep.33.4.27

Skocpol, T. & Harvard University. (2013). NAMING THE PROBLEM. In Columbia School of Journalism & Scholars Strategy Network, *Prepared for the Symposium on THE POLITICS OF AMERICA'S FIGHT AGAINST GLOBAL WARMING*[PDF]. https://grist.org/wp-content/uploads/2013/03/skocpol-captrade-report-january-2013y.pdf

Sydney Business Insights. (2023, June 6). More than nudges are needed to save the world from climate change. *Sydney Business Insights (SBI)*. https://sbi.sydney.edu.au/more-than-nudges-are-needed-to-save-the-world-from-climate-change/

Tietenberg, T. (2010). Cap-and-Trade: the evolution of an economic idea. *Agricultural and Resource Economics Review*, *39*(3), 359–367. https://doi.org/10.1017/s106828050000736x

Nudges for Emissions Reductions

Nudges can be an effective intervention across a number of major polluting consumption categories. However, they have also been shown to crowd out support for systematic solutions, a tactic purposefully carried out by the fossil fuel industry.

Still, there is a growing body of research regarding this area, especially in the context of household energy use. In transportation, there are a good deal of interventions involving air travel, car travel, and public transportation.

Allcott, H. (2011). Social norms and energy conservation. *Journal of Public Economics*, *95*(9–10), 1082–1095. https://doi.org/10.1016/j.jpubeco.2011.03.003

Baiocchi, G., Feng, K., Hubacek, K., & Walters, C. (2022). Carbon footprint of American lifestyles: a geodemographic segmentation approach. *Environmental Research Letters*, *17*(6), 064018. https://doi.org/10.1088/1748-9326/ac6e76

Benartzi, S., Beshears, J., Milkman, K. L., Sunstein, C. R., Thaler, R. H., Shankar, M., Tucker-Ray, W., Congdon, W. J., & Galing, S. (2017). Should governments invest more in nudging? *Psychological Science*, *28*(8), 1041–1055. https://doi.org/10.1177/0956797617702501

Bergquist, M., Thiel, M., Goldberg, M. H., & Van Der Linden, S. (2023). Field interventions for climate change mitigation behaviors: A second-order meta-analysis. *Proceedings of the National Academy of Sciences*, *120*(13). https://doi.org/10.1073/pnas.2214851120

Dietz, T., Gardner, G. T., Gilligan, J., Stern, P. C., & Vandenbergh, M. P. (2009). Household actions can provide a behavioral wedge to rapidly reduce US carbon emissions. *Proceedings of the National Academy of Sciences*, *106*(44), 18452–18456. https://doi.org/10.1073/pnas.0908738106

Do we need to change our behaviour to reach net zero by 2050? – Analysis - IEA. (2021, October 29). IEA. https://www.iea.org/articles/do-we-need-to-change-our-behaviour-to-reach-net-zero-by-2050

Hagmann, D., Ho, E. H., & Loewenstein, G. (2019). Nudging out support for a carbon tax. *Nature Climate Change*, *9*(6), 484–489. https://doi.org/10.1038/s41558-019-0474-0

Mormann, F. (2022). Climate Choice architecture. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4096179

Vandenbergh, M. P., & Steinemann, A. C. (2007). The Carbon-Neutral individual. *New York University Law Review*, *82*(6), 1673. https://findanexpert.unimelb.edu.au/scholarlywork/958976-the-carbon-neutral-individual

Two Articles of Particular Note/Major Thought Influence

How Big Oil helped push the idea of a 'carbon footprint' | On Point

I consider this to be a very important starting point for the idea of a carbon footprint and the influence of the fossil fuel industry. It gives an incredibly telling insight into just how well and for just how long the fossil fuel industry has used behavioral insights to shape how we view environmental problems.

BP hired an ad agency to popularize the concept of a carbon footprint to strategically shift responsibility for climate change from corporations to individuals, effectively deflecting blame and preventing systemic change. But their influence is not new. PR executives for Standard Oil, Mobil, Exxon, have deliberately influenced public discourse and framing since the early 1900s.

On Point is a national show of Boston's NPR, WBUR.

Ackerman, D., & Chakrabarti, M. (2023, December 19). How Big Oil helped push the idea of a "carbon footprint" | On Point. *WBUR.org*. https://www.wbur.org/onpoint/2023/12/19/how-big-oil-helped-push-the-idea-of-a-carbon-footprint

From a cultural to a distributive issue: Public climate action as a new field for comparative political economy

I found the comparative political economy framework established here to be the most helpful in describing climate action, specifically in the context of carbon emission regulations. It breaks the issue into electoral politics (EP) and interest group politics (IGP). It best handles the nuance of both the public opinion side of electoral politics and the organized (particularly industry) interest side of interest group politics. This gives the best context for my "Dancing With the Devil" intervention.

This paper probably excited me the most out of any of the published papers I read. Which I think is because it is so close to what I was trying to think about by the time I got to it. In a way, I wished I had read it earlier. But it also excited me because it was so recent, and because I had something to say about it. In fact I was surprised by how recent it was. It was a good feeling, and one that I don't necessarily get as often in purely analytical economics, that I felt like I could connect to recent research and have my own insights. Some nit-picks I have with it are over its dismissal of carbon trading and, though it mentions it, essentially ignores the oil production/import/export differences between the US (a lot produced here/Canada) and the EU/China (import almost all from OPEC+).

Note: I have also included the sources it referenced to support the efficacy of elite signaling in climate change beliefs. I found the Tesler article particularly helpful.

Brulle, R. J., Carmichael, J., & Jenkins, J. C. (2012). Shifting public opinion on climate change: an empirical assessment of factors influencing concern over climate change in the U.S., 2002–2010. *Climatic Change*, *114*(2), 169–188. https://doi.org/10.1007/s10584-012-0403-y

Carmichael, J. T., & Brulle, R. J. (2016). Elite cues, media coverage, and public concern: an integrated path analysis of public opinion on climate change, 2001–2013. *Environmental Politics*, *26*(2), 232–252. https://doi.org/10.1080/09644016.2016.1263433

Guber, D. L. (2012). A cooling climate for change? Party polarization and the politics of global warming. *American Behavioral Scientist*, *57*(1), 93–115. https://doi.org/10.1177/0002764212463361

Schwander, H., & Fischer, J. (2024). From a cultural to a distributive issue: Public climate action as a new field for comparative political economy. *Regulation & Governance*. https://doi.org/10.1111/rego.12620

Tesler, M. (2017). Elite domination of public doubts about climate change (Not evolution). *Political Communication*, *35*(2), 306–326. https://doi.org/10.1080/10584609.2017.1380092

Jacobin Climate Socialism

These articles also had a large influence on my thinking, though in a slightly different way. I agree with many of the points made in these articles.

Some quotes:

On Milton/Helene costs vs inflation reduction act:

"If we take the higher end of the damage estimates — or about $335 billion — that's about one third of that same total, and it comes close to equaling the original price tag of the IRA, which, again, is the planned spending over the next decade. And that's only these two hurricanes."

"But to reiterate, even talking about the monetary cost of climate change is somewhat absurd in the face of its vast human consequences: death, disease, starvation, war, political instability, and mass human displacement, not just from other countries but within the United States too. The smartest thing to do, and the biggest bang for the US taxpayer's buck, would be to start making unprecedented investments"

"The idea that people with concerns about a green transition are just victims of misinformation is fundamentally condescending. For one, most people are not in fact swayed by corporate reassurances"

They are admittedly quite radical and revolutionary. The main issue I have with them is their demonization and extensive false dichotomizing of carbon pricing. The *It's Time to Abandon Carbon Pricing* article particularly ticked me off. They propose as the best solution a great green workers' revolution. I'm all for it (maybe shouldn't say if I ever want to run for president!), but

they can criticize their hated "market solutions" once they actually start this revolution. I also included *Beyond the ABC: Climate Change Policy and Theories of Social Change* because the social change perspective was useful and I thought it was funny that the author described it as "short and deliberately provocative".

"Awareness" will not save us from climate disaster. (2022, May 12). https://jacobin.com/2022/05/awareness-climate-change-disaster-working-class-professionalism-policy-green-new-deal

Capitalism is what's burning the planet, not average people. (2021, August 11). https://jacobin.com/2021/08/ipcc-sixth-assessment-report-climate-change-denial

It's Time to Abandon Carbon Pricing. (2019, September 24). https://jacobin.com/2019/09/carbon-pricing-green-new-deal-fossil-fuel-environment

Lifestyle environmentalism will never win over workers. (2021, August 2). https://jacobin.com/2021/08/lifestyle-environmentalism-will-never-win-over-workers

Obsessing over climate disinformation is a wrong turn. (2024, August 24). https://jacobin.com/2024/08/climate-disinformation-green-transition-workers

Preventing climate change isn't expensive. doing nothing is. (2024, October 18). https://jacobin.com/2024/10/climate-change-hurricanes-cost-war

Shove, E. (2010). Beyond the ABC: Climate change policy and theories of social change. *Environment and Planning a Economy and Space*, *42*(6), 1273–1285. https://doi.org/10.1068/a42282

The Biden administration is undermining global Carbon-Reduction efforts. (2023, December 1). https://jacobin.com/2023/12/joe-biden-administration-carbon-reduction-global-climate-cop28

The GOP playbook for Sabotaging Environmental Regulations. (2024, November 3). https://jacobin.com/2024/11/gop-republicans-environment-epa-regulations

The market will never solve the climate crisis. (2023, February 13). https://jacobin.com/2023/02/big-oil-companies-market-capital-climate-crisis-renewable-energy

Everything else (in reference section at very bottom)

All of the other sources linked were of some note or served as evidence. They are generally related to political economy and the feasibility of carbon action. It is of note that there was a great deal of literature in the late 2010s following the Kyoto Protocol and various failed US policies. For effective implementation, *The Effects of Policy Design Complexity on Public*

Support for Climate Policy was of particular use for me. You can see the development of both the systematic literature and the personal behavior literature. The time at which it is written and which category it is in means a great deal for the perspective and biases of the authors, including the academic papers (which most of these are).

Benjamin Abrams

Preface to my Behavioral Scientist Op-Ed

Climate change is perhaps the hyperbolic discounting question of our time. Not only are the effects incredibly temporal—they are also spatial. We don't know how much or when the effects of climate change will hurt us. In order to avoid the complete consequences of the climate change we are currently heading for, we must reduce our fossil fuel use and carbon dioxide emissions.

Many behavioral interventions have been designed and proposed to reduce carbon emissions. The major group falls into what I will call the "personal carbon footprint" category. These are proposals for individuals, most commonly in "Global North" developed nations, such as ourselves, that would reduce our consumption of fossil fuels. The World Wildlife Fund helpfully gives, for "5 Changes [I] Can Make":

1. Reduce your energy use and switch to renewable energy
2. Change the way you travel
3. Change what you eat
4. Change how much you buy and who you buy from
5. Campaign and vote!

These are not insignificant intervention recommendations. US citizens consume at relatively massive rates, and meaningful change can come from widespread lifestyle changes. Behavioral solutions in the context of reducing carbon dioxide emissions and polluting behavior are particularly nuanced. Individual interventions are the most well-known applied examples.

We have talked about some of these interventions in class. As one of the largest sources of carbon emissions, the energy sector is a particular focus of intervention design. Choice architecture and framing are especially helpful lenses—seeing how much energy you use compared to your neighbor, for example. However, this is also the preferred plan of the fossil fuel industry, a dynamic underlying all carbon regulation discussions in this country.

I have come to the dramatic conclusion that without an elite-driven public opinion movement within the next five years, we will likely never see appropriate, peer-reviewed, scientist-backed federal emission reductions in the US. That claim is admittedly quite verbose—five years is also an arbitrary timeframe anyway. Regardless, it is a conclusion of my reasoning that after some point, retrenchment by the fossil fuel industry will be a success and an insurmountable politized issue.

There is natural counterpoint against fossil fuel interest. One is the continuance of climate change. At some point, people will see the effects of our emissions. This could create unmistakable support for climate change policy. Increasing climate disasters will lead to increasing difficulties in accessing fossil fuels. Renewable energy sources will also continue to get cheaper and fossil fuels more

expensive. This is because fossil fuels are not renewable and will run out. Renewable energy technology will continue to get cheaper and more widespread from pure market incentives - firms will see opportunity for profit in the renewable energy sector and enter.

What does this mean for intervention? There are different implications for each point. For the first - it is important to remember that we don't know when this "natural" perception tipping point will be. Renewable energy technology will also continue to get cheaper and more widespread due to pure market incentives. Firms will see opportunity for profit in the renewable energy sector and enter the market.

This project became much more understandable once I figured out the scale that I am interested in. I thought I would start off with the massive question of how to reduce fossil fuels and work my target group down from there based on what I found to be most effective. Apart from now knowing that I should certainly start with a more focused topic, I also now know that I am still exploring how governments and businesses change the way we think.

There was a large part of this project where I was planning on working slightly outside the scope—looking at how behavioral interventions could be applied to companies and industries, how they could perhaps be used to influence policymakers, and how popular support could be garnered to elect climate-friendly policies.

This line of logic led me to the conclusion of needing to figure out how to get individuals to change the way governments and businesses think. I realized that this is supposedly what government IS, at least in a representative democracy as we claim to be here in the United States. And in that way, I came to the conclusion that I am trying to explore how governments and businesses affect the way governments ("we the people") think.

What is the point of my rambling chain of "logic"? I think it is somewhat essential to preface my exact intervention with this general idea. My intervention target group is the United States government. That, of course, means that my target group is all Americans—and I come to them from both directions. Both because they affect the government and because the government affects them. I found the framework from comparative political economy to be the most useful in thinking of interventions.

Considering all of this, my Op-Eds to Behavioral Scientist. The first roughly aligns with Part II of the project, the second roughly with Part III:

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Part I: Analysis and Diagnosis of the Social Problem

I have come to the dramatic conclusion that without an elite-driven public opinion movement within the next five years, we will likely never see appropriate, peer-reviewed, scientist-backed federal emission reductions in the US. That claim is admittedly quite verbose—five years is also an arbitrary timeframe anyway. Regardless, it is a conclusion of my reasoning that after some point, retrenchment by the fossil fuel industry will be a success and an insurmountable politized issue.

Considering my five-year timeframe—how do I make sense of a looming Donald Trump presidency? Do I leave hope for a year after his presidency? Even in the best-case scenario in which a pro-environmental presidential candidate is elected alongside a majority pro-environmental congress, wide-sweeping carbon policy is almost politically impossible. If a large enough majority is won, then there is a chance. But it would be contentious and would not guarantee long-term follow-through (as evidenced by the ease with which Trump left the Paris Agreement).

And climate action should start as soon as it can. Every year matters when it comes to our emissions, the next four included. And, as I will argue, I think it is both possible and the best option for public carbon action support to be gained during the Trump presidency.

Research shows that one of the only effective interventions in changing opinions on climate change is elite signaling. This is generally done through how politicians vote. Not only do they control the outcome of policy, but they also influence the behavior and opinions of their constituents. The difficulty is that oil companies have already figured this out. How do we get politicians to change their votes? That's the question we were attempting to solve anyway.
It would at this point be helpful to expand on one of these most recent nuances.

Oil companies are the behavior interventionists that we are "up against". Their PR directors have been working on campaigns to influence how we behave in relation to energy and natural resources really since their inception. They are why climate change is a politicized issue. Highly educated Republicans were *more* likely than Democrats to believe in human-caused climate change as recently as the 90s. That is not very long ago! This points to a very powerful intervention having taken place to influence voting behavior and norms surrounding the environment and science.

No climate advocate has truly been able to get past their creation and protection of fossil fuel norms. Oil companies have used their knowledge of social networks and their power to

completely shape how a large part of our country views our environment and science. That is not to say there has not been effective communication in defense of the environment. Take *An Inconvenient Truth*. It is a textbook example of an education campaign (depending on your definition of education). But unfortunately, so are the Koch brothers. And although there is now some work being done in communities traditionally controlled by the fossil fuel industry and their social networks, the fossil fuel industry has had a huge head start. And they have gained a huge advantage in working with behavioral science and within the American political system. They, too, have the benefit of being able to protect their status quo - something especially encouraged by our political system.

I have claimed the five-year timeline in part because I have the belief that after five years, the oil industry will have successfully politicized climate change to a point of no return.

So our elite-led intervention cannot come from traditional political signaling. But, as implied by the upcoming sub-heading, I believe there is an alternative, accessible path. But, as also implied by the title, this will likely not be too popular amongst the Behavioral Scientist readership. I think change must happen through Elon Musk and RFK Jr.

Dancing with the Devil (or The Devil's Advocates?); an Intervention in the Next Four Years

This is with full knowledge that neither of these people is in charge of the EPA. And that the person Donald Trump has picked to be his EPA administrator, Lee Zeldin, is certainly not an environmental advocate. And that RFK Jr. is the nominee for secretary of the Department of Health and Human Services (not the EPA) and is an anti-vax conspiracy theorist. I am certainly making no comment on their character. Actually, I will - they are both mostly bad people in my eyes. But they are both environmental advocates. And they are elites.

You may have noticed that I have so far shied from proposing a real behavioral intervention, instead exploring how behavioral science has been used by adversarial actors to prevent meaningful climate action in the United States. This is too bad, because I could write a lot about the political economy of climate action and the unfortunate behavioral and rhetorical genius of the fossil fuel industry (some names that come to mind - Herb Schmertz, BP, Standard Oil, Ogilvy and Mather ("carbon footprint" ad agency)), Earl Newsom, this article). Oil firms were some of the earliest to use market research, and they've used it to shape the way we view the economy. But we cannot let them continue to monopolize using behavioral insight to control

the future of our planet. I think we can play them at their own game. And win, because, despite fossil fuels' tireless effort, people still support the environment and nature.

Benjamin Abrams

Part II

Intervention Design and Implementation

The following intervention design will be two-part. In the first part, I will attempt to propose an intervention that will successfully change the behavior of insider environmental "swing" elites in politics. In the second, I will outline already tested behavioral interventions and nudges that can successfully be implemented alongside regulation. The second part is considerably easier considering the vast body of research showing effective climate change nudging, despite its purposeful use as a distraction to wider, systematic change.

I think social networks are likely the best access point to figures such as Elon Musk or RFK Jr, both figures with a connection to Donald Trump and at least a history of climate advocacy. I think it is important to identify figures of influence within their circles, specifically business figures. This intervention would most realistically be started by a particularly pro-environment business leader or a leader at an institution such as the IMF. They would have to play a radicalizing role for one of the insiders within Donald Trump's circle. With one or both of Musk and RFK Jr, there could be enough attention to start long-term framing shifts.

A particularly strong pressure point for these figures, especially Musk, would be the cost of fossil fuel subsidies. Tens of billions are going into fossil fuel subsidies in the United States. Why fossil fuel companies posting record profits need such tax-funded support is a question that could be posed in a way to begin to sow seeds of uncertainty and a pathway to easy institutional signaling. It may be that a reduction in fossil fuel subsidies should not be overly emphasized until it has happened and alternatives can be shown.

A reduction in fossil fuel subsidies could be a signal that fossil fuel companies don't need our support. This would be particularly effective paired with an implementation of clean-energy jobs. Framing this as a causal connection could be most effective: "We reduced fossil fuel subsidies by $20 billion *which* created x thousand jobs." It may also be effective to frame it with personal costs to voters in certain states: "We saved $1 billion this year by reducing handouts to fossil fuel companies, which also allowed for x new companies to enter the state and drive economic growth".

It is incredibly important for messaging to be location specific. Oil companies have complete control over media in many rural, fossil fuel-dependent towns. This includes but is

certainly not limited to the local newspaper, TV stations, billboards, school boards, and radio stations. And residents of these places rationally tie their jobs and livelihoods to fossil fuel companies and their success. That is why there has to be real short term, local benefit highlighted. A “Close Big Oil Tax Loopholes Act” was introduced in 2010 and reintroduced in 2022. Unfortunately it was introduced by Bob Menendez. But I think something like this could be reframed by a Musk figure.

States have different levels of dependency on fossil fuels for their economies. I think it would be important to identify “swing” states - states that already have some experience with clean energy or “green” jobs and are less controlled by fossil fuels. Though it would be fair to assume that all of the Congresspeople from these areas are currently lobbied by fossil fuel interests, it may be possible to fight this with the lobbying power of the blessing of Elon Musk and, in turn, Donald Trump. The incredibly in-line and hierarchal nature of the GOP could be used by figures of power within to hold certain priorities. Politicians would have to be moved together, at least within states and regions. There is still a risk of a replacement of these politicians by voters, but the risk would be lower.

Given Musk’s background with Tesla, support for electric vehicles and electric vehicle production could be another entry point. This has the benefit of being tied directly to job creation. It is, unfortunately, not this straightforward. As far as job creation goes, there are far more clean-energy jobs being created already. This could be expanded. However, this also means that despite already existing rationale for a transition to these sectors, support for this shift and climate action is low. This would mean there would have to be more than just job creation emphasized - we already have that and it hasn’t worked.

I think an important signal too would be international agreements and the perception of international relations. There is an overwhelming perception that the United States would be too hurt by free-riding nations if we adopted carbon reduction policy. Though there are places where the United States could be said to relatively overcompensate, carbon emission reductions is not one of them. We are, in fact, the free riders. The EU is doing more than us. China is doing more than us.

It is important to say here that they also have a greater claim for the need of energy independence - seen through the socio-political geographies of the EU and the vast oil imports of China. The United States, on the other hand, while importing.

This is why I feel like something like the Paris Agreement would be an incredibly strong signal. I think it may be too strong of a signal for someone like Musk to target Trump staying in early in his presidency. I think it could cause too much backlash and threaten the place of a pro-environmental insider. Proposals and positions of these insiders must be incremental, both so that they guarantee some change and so that they do not lose their position of influence by overstepping.

It is important that a figure like Musk could come close to meaningfully going up against oil firms economically, if he so chose to make it a priority. But as with any figure in the GOP, his position is far from stable. The Paris Agreement is currently too vilified. Eventually, it could be a goal, and a very significant one. At the very least, it may be helpful as a driving point for the radicalization of a figure like Musk.

I have not spoken much on RFK Jr. Again, alas, he is picked to be head of HHS, not the EPA. But he does understand incredibly personally the reach of corporate capture of our planet's future. Unfortunately, he is spouting conspiracy theories that will undermine our country's public health. But he is, to an extent, right about the issue of corporate capture. He has personally litigated against polluting firms.

There is a strong case to be made for the damage done to public health done by polluters. A focus on this, instead of vaccine fearmongering, could be both of great benefit to the environment and something in line with his values. Since he is exactly *not* fossil fuel captured, a figure like him would also be an opposing political influence to the fossil fuel lobby for GOP politicians needing Trump support. And there is strong, relatable signaling from the decrying of the clear "bad-guy" polluters.

Truthfully, I should have just done this project on behavioral interventions around reducing energy usage. They're textbook nudge and choice architecture examples. And, despite being a distraction from their systematic implementation, they can work. This article is more interested in how to get them in a position to be passed and required, but I will briefly discuss their use here. At least to show that I understand the course material and that I understand the intended scope of the assignment. They can be easily scaled up to go along with a carbon cap and trade system (my preference for systematic regulation). For empirical evidence on their crowding out effect, see *Nudging out support for a carbon tax.* For evidence from oil firms stating this as

their goal, listen to the On Point podcast episode of *How Big Oil helped push the idea of a 'carbon footprint'*.

The most consistent literature has been done in the energy sector. We in class discussed the efficacy of the Allcott neighbors' energy usage comparison. The *Should Governments Invest More in Nudging?* section on energy conservation is an effective starting point of related ideas. As a cop-out to creating novel interventions and in a plea for space, I point to their overview.

Table 4. Relative Effectiveness of Interventions Targeting Energy Conservation

Article	Intervention type	Treatment	Impact	Cost	Relative effectiveness
Allcott (2011)	Nudge	An independent company sent reports to residential consumers that contained comparisons to neighbors' electricity usage and tips for conservation.	2.0% reduction in energy usage on average[a]	Approximately $1 per report, with reports sent monthly, bimonthly, or quarterly	27.3 kWh saved per $1 spent[a]
Asensio & Delmas (2015)	Nudge	Researchers granted residential consumers access to a Web site sharing their detailed appliance-level electricity usage, with messages linking this usage either to health and environmental issues or to increased utility bills.	Health and environmental messages: 8.192% (4.306) reduction in energy usage; billing-oriented messages: negligible effect	$3,019 per household	Health and environmental messages: 0.050 (0.026) kWh saved per $1 spent; billing-oriented messages: negligible effect
Ito (2015)	Traditional (financial incentive)	Residents in California received discounts on their electricity bills if they reduced their summer energy usage by at least 20% relative to the previous summer.	4.2% (1.3) reduction in energy usage in inland areas and negligible effect in coastal areas	$3.70 per customer for rebates plus $1.39 per customer for administrative and marketing costs	3.41 kWh saved per $1 spent[a]
Arimura, Li, Newell, & Palmer (2012)	Traditional (financial incentive and education)	Utility companies provided incentives and education to reduce energy usage during peak times and promote investments in efficient products.	0.9% (0.5) reduction in energy usage during intervention period and 1.8% (1.1) reduction when including effects in future periods	$10.83 per customer on average	14.0 kWh saved per $1 spent[a]

Field interventions for climate change mitigation behaviors: A second-order meta-analysis is another good overview for what interventions work for improving environmental behavior – I recommend states such as New Jersey implement the effective interventions regardless of federal policy. I think this is a possibility for all states in the RGGI and California

Though I heavily criticize his emphasis on the foremost importance of nudges as borderline oil propaganda (Thaler, for example, puts nudges decisively behind carbon pricing), Felix Mormann's overview in *Climate Choice Architecture* is a good overview of design of these interventions.

There is work being done in carbon reduction nudging across many industries. For transportation, I point to the IEA's Net Zero Behavioral Overview. Food consumption, overall consumption norms, and circular supply chains are other major categories of note.

Benjamin Abrams

I found myself continually going back to a reflection of my process as I was drafting this intervention. More of an epistemological review of coming to the decision of my intervention group and who's doing the intervention. To take that somewhat out of the intervention and as an apology for the late submission, I have decided to aggregate some of that reflection here, with some suggestions for a more effective working project. An intervention for myself to work more efficiently and happily. So, without further ado…

RECOMMENDATION FOR STAKEHOLDER (FUTURE STUDENT)

Do choose something you're really interested in. You are smart enough to have something (or many things) that you can yap about. One of my favorite realizations from this course is anything is behavior based. So first think what you're interested in and find behavior relating to it, rather than starting with a behavior. Or, if you have an intervention that you're already interested in, think about what part of it you really care about.

Do not stay with that general interest, unless you have one specific intervention already in mind. Even if you have a lot of interventions and options in mind, try to choose one first then research. You should know enough about your topic that you already have some preference for intervention. Though you could try to go for a review of all options, it's unnecessarily difficult. You will get stuck. If you do choose this, I would highly recommend doing your research and summarizing papers as you go along. If you don't, you will almost certainly have too much in your head. At least I did. And then when you come back to synthesize, you have 50 tabs and 100 more papers in your head to try to cite. You will become very very frustrated because, even if you go outside the scope of the project, you will need your sources. If you want to really go into a specific intervention and still cover others, you can do that at the end. Or just talk about the one you start with and compare it to another intervention or topic some other time. It will be a good future essay starter. Or a fun distraction (if fun means to you designing behavioral interventions).

Instead, what I recommend, if you do choose to do read a lot of research and media on your topic, is to find something that you most closely agree with. Something already written and thought, preferably something from an academic journal for convenience. But it can be an article, or a video, or a podcast, or an instagram reel. Take what they say and review it. Give your more specific intervention based on that. Choose the specifics that you think are best. The ones

you like. The benefit of basing this on existing work is that you can still create something novel while already having your sources laid out in front of you. That's why I suggest basing it off a recent academic paper, one that you really like. You can summarize it and its sources for your literature search. Maybe find a few articles that give more basis for your thoughts and intervention (less technical than a paper because you should have opinions on it) and summarize those. That's a great literature search. And it doesn't have to take hundreds of hours. And it won't make the next parts of your project a nightmare.

I recommend a recent paper because then you can see what people who have already done a literature search recently have done. I highly recommend Semantic Scholar. Consensus is good too. If you find a broad article, you can base your intervention off of that if you want to be broad. If you want to be specific (which I recommend), you can find what is referenced in that broad paper.

Before starting your intervention (ideally even before thinking about it), deeply reflect on who your intervention group is and very importantly, who is doing the intervention. It would probably be best to do this before your literature search and after. If you do a good job at finding a specific intervention, then this much more achievable. If, like me, you want to go way too wide, you're not done for. But please, please do reflect longer on your intervention group and who is doing the intervention. You can come do really interesting conclusions if you go wide. But you need to know the whos. It will save you so much difficulty.

Finally, for the actual logistics (the doing). If you do the first part in a helpful way this shouldn't be too hard. Because you chose something you care about and you should be able to talk about it in a focused way considering your sources are already connected. This is why it's so important to get specific. Because if you do something you really like, it will be much too easy to get overwhelmed with how much you want to write. But unfortunately, it feels much, much harder in practice.

Dr. Shepherd will give you so much help. Just get anything down. It can be a disorganized mess of thoughts. The hard part with writing is that what you write first *will* be less organized than you would like. Procrastinating may feel like it forces you to synthesize your thoughts - and maybe you will have thought about it for longer - but really it is just putting off the (relatively) disorganized mess of thoughts. And I say relatively because you will still likely have a good project because you are smart. A project that you will be able to get away with and

do well with. But please trust me that it truly is so much rewarding to have something that you really like. And it's so much easier. It doesn't have to be hard! Maybe you have an executive function disorder and need medication (like me)! Maybe you need to implement the behavioral study self-intervention of your choice. A nudge even! You will certainly need practice. But it doesn't need to be hard.

It especially doesn't need to be hard because Dr. Shepherd will help you. Especially considering because you care about what you're writing about. She will be able to refer you to whatever relevant research you need. She will help you find that seed paper. She will give you so much helpful feedback. But it does mean you need to do the (maybe right now) hard part of starting.

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